6. PUBLIC SERVICES & UTILITIES

SANITARY SEWER FACILITIES

There are approximately twenty-two sewage treatment plants, of varying sizes, located within Culpeper County. The Table below lists those treatment plants that generally serve commercial or industrial sites or major residential developments (see Table 6.1 and Map 6.A). The majority of County residences and businesses rely on individual septic systems and, in a few cases package treatment plants.

TABLE 6.1

WASTEWATER (WWTP) TREATMENT PLANTS

1. AMERICAN SECURITY COUNCIL	**5. SALVATION ARMY (CAMP HAPPYLAND)**
2. COFFEEWOOD CORRECTIONAL FACILITY	**6. SOUTH WALES UTILITY INC.**
3. EMERALD HILL ELEMENTARY SCHOOL	**7. TOWN OF CULPEPER**
4. PIEDMONT TECHNICAL SCHOOL	**8. COUNTY OF CULPEPER (Culpeper County Air Park)**

(CULPEPER COUNTY STAFF)

The largest sewage treatment plant in Culpeper County is located east of the Town of Culpeper limits and discharges into Mountain Run, a tributary of the Rappahannock River. It has a capacity of 3.0 million gallons per day (mgd). This plant predominantly serves the Town of Culpeper, but treats approximately 0.09 mgd [87,630 gallons per day (gpd)] from residences and businesses located beyond Town limits. Effluent is pumped through a 20-inch force main to the plant from a lift station, fed by a 36-inch trunk gravity sewer serving as a collector for the Town's sewer systems. The wastewater treatment plant currently treats an average daily flow of 1.45 mgd. The Town of Culpeper awarded a contract in December 2003 to renovate portions of the plant and add facilities to accept septage. The Town plans to expand the wastewater treatment plant to 4.5 MGD.

The disposal of sludge is the major limiting factor within the treatment process. Digested sludge can be disposed through land application such as fertilizer for agricultural land. Culpeper County ordinances allow the Town and other localities to spread biosolids on agricultural land in the County.

The County of Culpeper owns and operates a wastewater treatment plant in the Culpeper County Industrial Airpark, located next to the County Airport. The wastewater treatment plant has discharge authorization by Virginia Pollution Discharge Elimination System (VPDES) Permit No.VA0068586, and discharges into Hubbard Run, a tributary of the Rappahannock River.

TABLE 6.2

WASTEWATER FLOW DATA FOR TOWN OF CULPEPER TREATMENT PLANT

MONTH	AVERAGE DAILY FLOW (MGD)
2001	
JANUARY	1,794,710
FEBRUARY	1,688,607
MARCH	2,224,484
APRIL	2,119,600
MAY	1,997,484
JUNE	2,224,733
JULY	1,836,806
AUGUST	2,208,419
SEPTEMBER	1,748,200
OCTOBER	1,824,548
NOVEMBER	1,575,300
DECEMBER	1,624,806
2002	
JANUARY	1,700,484
FEBRUARY	1,587,607
MARCH	1,880,710
APRIL	1,951,567
MAY	2,058,700
JUNE	1,707,677
JULY	1,676,065
AUGUST	1,671,645
SEPTEMBER	1,653,233
OCTOBER	1,940,968
NOVEMBER	2,855,833
DECEMBER	2,706,581

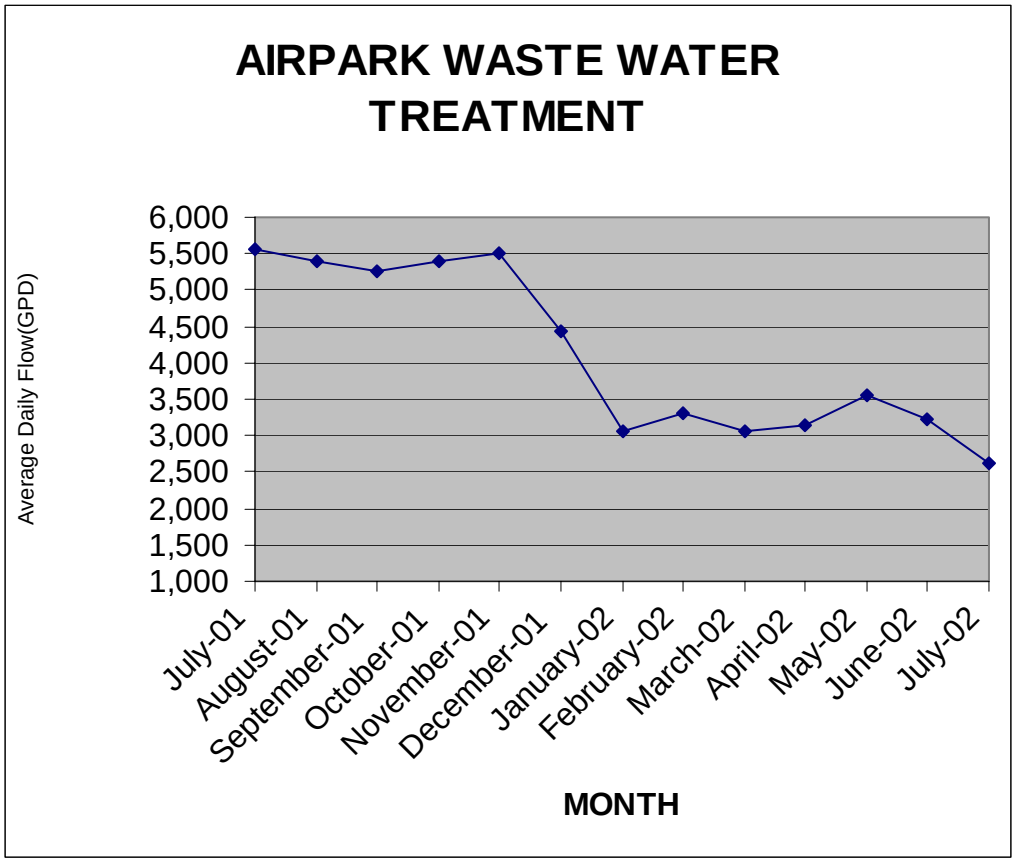
(TOWN OF CULPEPER)

The existing hydraulic design capacity for the Culpeper County Industrial Airpark wastewater treatment plant is 25,000 gallons per day (gpd). However, the VPDES permit is written so the County can expand the wastewater plant up to 300,000 gpd without requiring re-issuance. The request for the hydraulic upgrade was based on projected growth over the next 10 years. This plant currently treats an average of 4,249 GPD (see Figure 6.3A).

In May 2001 the County of Culpeper received a VPDES permit (Permit No. VA0090603) to build and operate a 900,000 GPD wastewater treatment plant on Hubbard's Run approximately 1.3 miles East of the existing plant. Culpeper County pursued this discharge location to accommodate future commercial and industrial development east of the Airpark. The County intends to construct this wastewater treatment plant in lieu of expanding the existing airpark WWTP. The new facility is further down gradient of the existing facility and will therefore serve a larger service area.

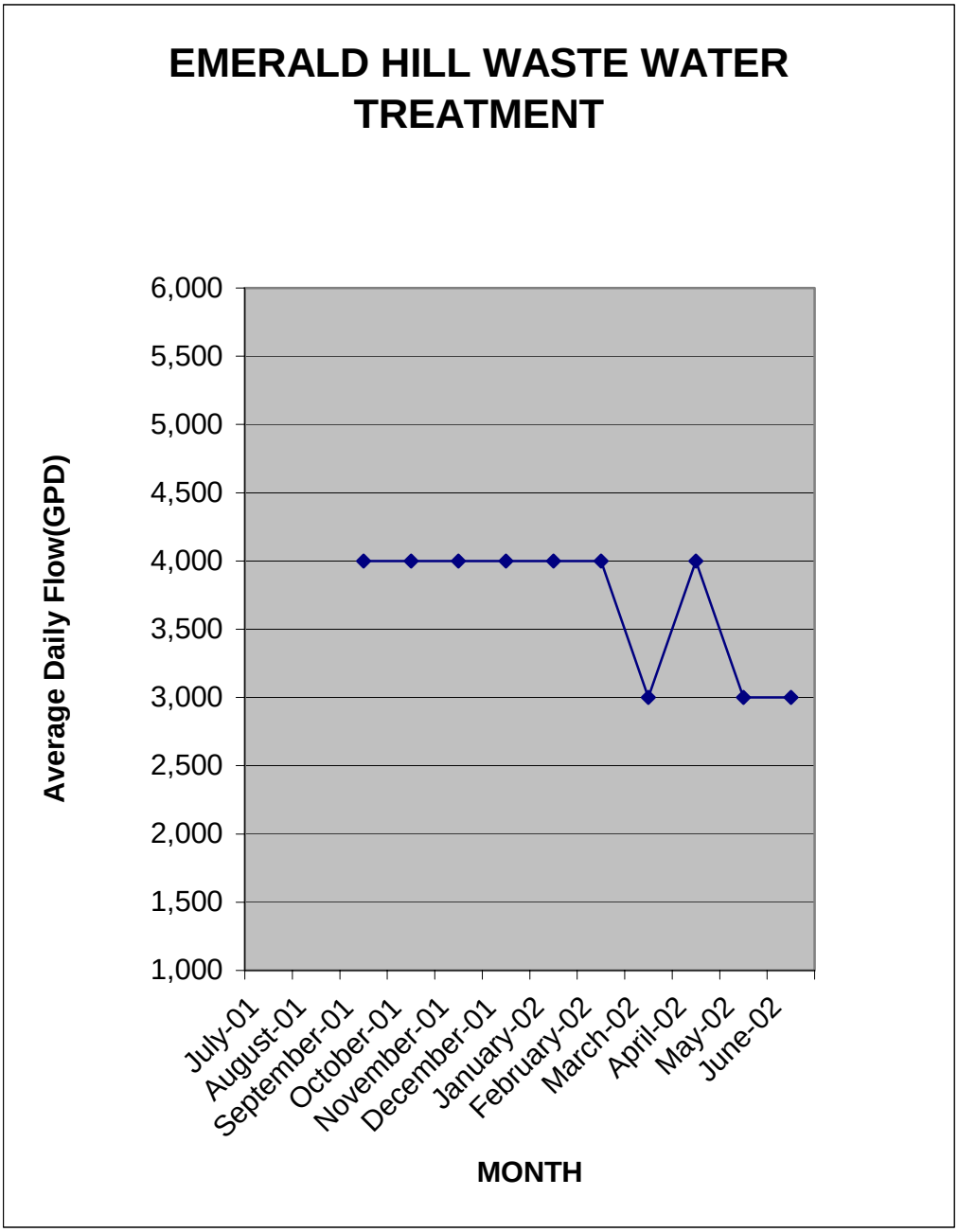
The existing wastewater collection system at the Culpeper County Industrial Airpark consists of 8, 10, and 12-inch diameter gravity sewer lines and four sewage pump stations with force mains.

Figure 6.3A



The Culpeper County School Board owns an extended aeration wastewater treatment plant at the Emerald Hill Elementary School, permitted with a design flow rate of 10,000 GPD. This plant is located on Route 229 approximately 8 miles north of the town of Culpeper. The County of Culpeper operates the wastewater plant on behalf of the School Board. The facility serves the school with a student population of 800. The average daily wastewater flow is 1,400 GPD (see Figure 6.3B). The plant discharges into Muddy Run.

Figure 6.3B



Coffeewood Correctional Facility, located in Mitchells Virginia, is a medium security prison complex with a separate juvenile detention facility. The Virginia Department of Corrections provides the County 20,000 GPD of treatment capacity for off-site use.

At this location the County utilized a Community Development Block Grant (CDBG) to assist with funding a small diameter force main grinder pump sewer system. The primary goal of the sewer system is to provide sewer service for low to moderate income (LMI) households and residences with failing septic systems. A secondary goal is to provide sewer service to other existing residential, commercial or institutional structures, at risk of failing septic systems due to poor soils in the area. Other residences and structures within the limited service area, which do not qualify as LMI

households, will be allowed to connect to the system. The County intends to minimize public health problems associated with failing or failed septic systems in the limited service area. It does not act as a public utility providing sewer service to the general public. New construction is not eligible for sewer service. Non-LMI households, which elect to connect to the system, have to pay for onsite improvements and service connections at their expense.

WATER FACILITIES

The Town of Culpeper is the major water supplier in the County of Culpeper. The Town's water source is provided by Lake Pelham and Mountain Run Lake. Raw water is withdrawn from Lake Pelham through an 18-inch gravity line to the Culpeper water treatment plant located within the Town's corporate limits. The safe yield from both lakes combined is 4.0 million gallons per day (mgd).

The Town water plant currently has the capacity to treat 4.0 mgd and the average daily demand on the system is 1.3 mgd. This plant predominantly serves the needs of the residences of the Town of Culpeper, with approximately 0.1 mgd [or 95,760 gallons per day (gpd)] used by residences and businesses located within the County but outside the Town.

Water storage consists of two 0.5 million gallon stand pipes located on the south side of Town, a 0.5 million gallon elevated storage tank located north of the Town, and another 1.0 million gallon elevated storage tank in the County, off Route 763. A groundwater well located on Spring Street is used to supplement the water plant with adequate amounts of emergency raw water at a rate capacity of 500 gallons per minute. Future water storage tanks to provide for service in the County, south of the Town corporate limits are projected to be located on Route 29, just east of Lake Pelham. The existing water supply of 4.0 mgd is estimated to be adequate to serve a population of 38,000.

The Culpeper County Industrial Airpark water system consists of two groundwater wells with yields of 120gpm and 114gpm, respectively. The wells are provided with over 50 feet of 6-inch diameter steel casings with total depths of 220 feet and 295 feet. The Virginia Waterworks Regulations require groundwater systems to be capable of supplying the daily water demands with the largest well out of service. By this definition, the rated capacity of the Airpark water system is 299,520 gallons per day (gpd).

The Culpeper County Industrial Airpark water storage system consists of a 300,000-gallon ground storage reservoir with a fire pump having a rated capacity of 2,000 gpm and 12-inch diameter mains. In addition, a 5,000-gallon hydro pneumatic tank pressurizes the distribution system. The average daily water consumption over the last 12 months is 8,580 GPD as shown in Figure 6.5.

TABLE 6.4

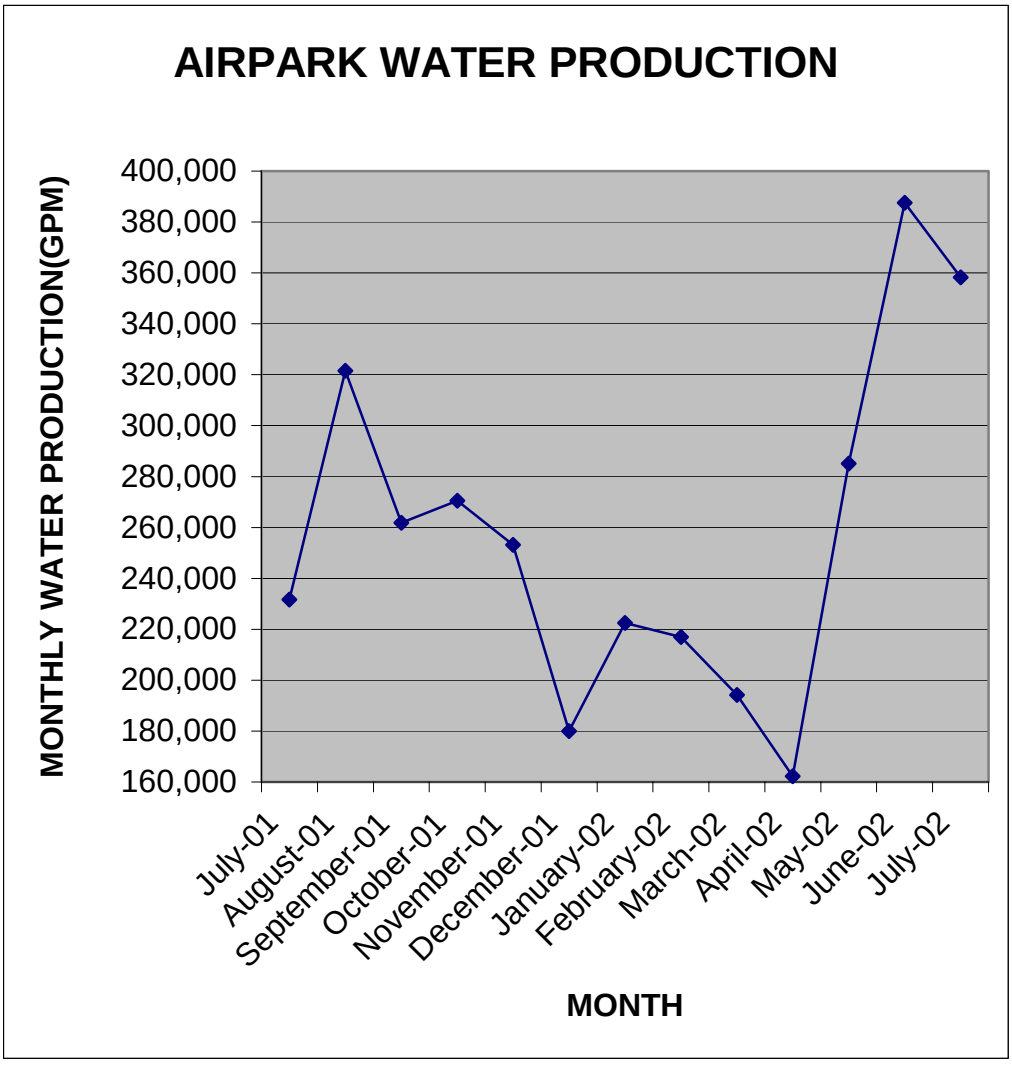
WATER CONSUMPTION DATA FOR THE TOWN OF CULPEPER WATER SYSTEM

MONTH	AVERAGE WATER CONSUMPTION GALLONS PER MONTH
2001	
JANUARY	**33,489,012**
FEBRUARY	**34,325,700**
MARCH	**30,017,300**
APRIL	**34,347,200**
MAY	**36,929,698**
JUNE	**35,811,058**
JULY	**36,545,276**
AUGUST	**38,099,502**
SEPTEMBER	**39,123,000**
OCTOBER	**35,202,700**
NOVEMBER	**31,580,738**
DECEMBER	**33,174,600**
AVERAGE MONTHTHLY CONSUMPTION	***34,887,149***
AVERAGE DAILY CONSUMPTION (30 DAYS)	***1,162,905***
2002	
JANUARY	**33,489,012**
FEBRUARY	**34,325,700**
MARCH	**32,576,100**
APRIL	**34,347,200**
MAY	**36,929,698**
JUNE	**35,811,058**
JULY	**37,754,644**
AUGUST	**39,086,845**
SEPTEMBER	**36,516,524**
OCTOBER	**34,118,053**
NOVEMBER	**37,263,717**
DECEMBER	**34,471,798**
AVERAGE MONTHTHLY CONSUMPTION	***35,557,529***
AVERAGE DAILY CONSUMPTION (30 DAYS)	***1,186,251***

(TOWN OF CULPEPER)

The Virginia Department of Health (VDH) water quality reports indicate that both wells exceed the secondary maximum contaminant levels for iron and manganese as defined by the Virginia Waterworks Regulations. Currently VDH does not require treatment of these secondary contaminants. However, because of the Safe Drinking Water Act, amended in 1996, over 120 contaminants were identified in the Act that require regulatory action by the Environmental Protection Agency (EPA). The most significant impact of these regulations to Culpeper County is the mandatory requirement for disinfection of all public water supplies using groundwater sources. The EPA has not set a final deadline to meet this regulation.

Figure 6. 5



Most of the County depends on groundwater to provide for its needs. The vast majority of residents and businesses rely on individual wells for their water supply. There are approximately 42 community (residential) and non-community (business) public water systems of varying sizes within the County (Table 6.6).

The shallow groundwater table in the Brandy Station area is considered bacteriologically unsafe for drinking water, primarily due to failing drain fields in the area. The Culpeper County Health Department, therefore, requires new groundwater wells to be drilled into the deeper aquifer approximately 250 feet deep. The wells are required to have grouted casings into the deeper aquifer to prevent contamination from the shallow aquifer.

TABLE 6.6

PUBLIC WATER SUPPLIES (COMMUNITY AND NON-COMMUNITY)

1. ASHMORE ACRES	**21. LAKESIDE MOBILE HOME PARK**
2. BAILEYS TRAILER PARK	**22. MERRIMAC SOUTH SUBDIVISION**
3. BRENRIDGE SUBDIVISION	**23. MOUNTAIN VIEW MOBILE HOME PARK**
4. CATALPA SUBDIVISION	**24. NORMAN ACRES**
5. CEDARBROOKE SUBDIVISION	**25. NORTHTOWN VILLAGE**
6. CHILDHELP	**26. OVERLOOK HEIGHTS I & II**
7. CHURCHILL SUBDIVISION	**27. PELHAM MANOR**
8. CLAIRMONT MANOR	**28. PIEDMONT TECHNICAL EDUCATION CENTER**
9. COFFEEWOOD CORRECTIONAL CENTER	
10. COMMUNICATIONS CORP. OF AMERICA	**29. PONDEROSA MOBILE HOME PARK**
11. CULPEPER MOBILE HOME PARK	**30. RANDLE RIDGE**
12. DUTCH HOLLOW SUBDIVISION	**31. ROTHERWOOD I SUBDIVISION**
13. EMERALD HILL ELEMENTARY SCHOOL	**32. SOUTH WALES**
14. ERINBROOK	**33. SPRINGWOOD SUBDIVISION**
15. FAIRVIEW ACRES	**34. Va. STATE POLICE – DIVISION HDQTRS.**
16. FOREST VIEW SUBDIVISION	**35. WARRENTON TRAINING CENTER**
17. GIBSON MILLS SUBDIVISION	**36. WESTLAKES SUBDIVISION**
18. HAZEL RIVER	**37. WESTOVER ESTATES**
19. HERITAGE ESTATES	**38. WESTVIEW TRAILER PARK**
20. KAVANAUGH MEADS SUBDIVISION	**39. WILDWOOD FOREST**

(CULPEPER COUNTY STAFF)

FUTURE SURFACE WATER IMPOUNDMENTS

Culpeper County, exclusive of the incorporated Town of Culpeper, is currently almost entirely dependant upon groundwater to meet its water needs. The County recognizes that while groundwater is expected to serve our needs even in the village center areas for the foreseeable future, we must plan for long-term water needs. The engineering firm, Wiley & Wilson, was contracted to prepare a report entitled “Culpeper County Reservoir Study,” which was completed in 2001. This report is hereby incorporated into the Culpeper County Comprehensive Plan by reference. The report includes:

- Preliminary site selection
- Stream flow analysis
- Schematic dam and reservoir layout
- Diversion pumping stations
- Permitting

The study evaluates reservoir sites in the northern and eastern portion of Culpeper County. The Rappahannock River forms the northeast border of the County. The study area extended as far south as Route 3 and as far west as the Rappahannock County line. The Rappahannock River was considered as the primary source for the reservoirs. Due to their size, the Thornton and Hazel Rivers, major tributaries to the Rappahannock River, were also considered.

Thirteen sites were selected and evaluated regarding volume, dam height, location, and conflicts with historic areas of major utilities. The four most promising sites are presented in the report. Further study by the staff and by the Public Works Committee of the Board of Supervisors has led to the conclusion that the most feasible surface water impoundment site is along Muddy Run, just east of Route 229. Future study is needed to evaluate the site geology and environmental Impacts. This site is identified as Site #10 in the report. Regarding site # 10,the report includes the following summary:

> *"Site # 10 & 10 A: Reservoir No. 10 and 10A would entail the construction of a dam on Muddy Run, to the west of Route 625.*
>
> - *The water to fill this reservoir would be pumped from the Hazel River, directly to its east and in flow directly from the watershed of Muddy Run.*
> - *The dam at this site would have a maximum height of 33.0 feet and crest length of 408 feet. The normal pool elevation would be 313 feet, with 7 feet of free board, a normal pool surface area of 243 acres, and a normal pool volume of 763 million gallons.*
> - *The earthwork volume required for the volume required for the dam embankment would be 33,900 cubic yards.*
> - *The maximum yield of this reservoir would be 3.5 MGD with or without diversion pumping. This indicates that Muddy Run Watershed is adequate to fill the reservoir and that pumping is unnecessary.*
> - *The maximum yield of the reservoir is dictated by the drought years of 1965 to 1966, where the mean daily flow in the Hazel River was below the mean annual flow for 311 consecutive days.*
> - *It is located in an area that is dominated by metabasalt geology with deep soil containing mica schist silts.*
> - *The reservoir would impact 27 parcels."*

Wiley & Wilson estimates the cost per million gallons per day of capacity at $810,000. Surface impoundment Site # 10 is depicted on Map 6.B. Care should be taken to limit development in the area in order to protect the ability to implement this reservoir should it be necessary in the future. All of the reservoirs identified in the Wiley & Wilson report should be considered when making land use decisions.

SOLID WASTE

Culpeper County's Department of Waste Management was created in 1991 and is responsible for the development and implementation of waste management programs. The County opened the Laurel Valley Landfill in 1978 (Permit No. 251) and closed it in November 1998. The closed landfill is located on a 330-acre site, where approximately 56 acres were used for landfill operations. The landfill is unlined. The County will continue to monitor the environmental effects of the unlined facility for the next thirty years.

The County received a permit from the Department of Environmental Quality to construct a new lined landfill (Permit No. 590), but chose to build a solid waste transfer station on the property instead. This solid waste transfer station is the only municipal solid waste disposal facility in the County. Culpeper County owns the facility, but Browning Ferris Industries Inc. (BFI) operates the facility, which serves both Town and County residents. BFI transports and disposes of the municipal solid waste at their Old Dominion Landfill in Henrico County. The contract with BFI expires in 2008. The County has an option to extend the contract to 2018.

Solid waste is collected by public (Town of Culpeper) and private haulers and disposed at the Culpeper County Solid Waste Transfer Station, located at Routes 522 and 638, approximately 2.3 miles northwest of the Town Limits (see Map 6.A). The Town provides regular collection services within the Town limits and a number of private companies serve County residents through individual arrangements. The bulk of solid waste in the County is collected by the individual residents are brought to the County Solid Waste Transfer Station or to the two residential convenience centers located at the Transfer Station entrance and Lignum. The County's Recycling Centers, where segregated recyclables are collected, are located at the Solid Waste Transfer Station, Lignum Residential Convenience Center, Dominion Square Shopping Center, Meadowbrook Shopping Center, and Culpeper Middle School.

The need for a second solid waste transfer station should be considered by the County. The planning for this second facility should begin soon in order to provide relief to the Laurel Valley Solid Waste Transfer Station. Growth in population has a symbiotic relationship with the volumes of solid waste which must be handled by the County.

ELECTRICITY

Electricity is supplied by Virginia Electric Power and distributed throughout the County by the Town of Culpeper, Rappahannock Electric Cooperative and Virginia Power. Three primary high voltage transmission lines exist in Culpeper County (see Map 6.A).

Currently, there are approximately 27 miles of transmission lines with utility easements up to 150 feet in width. One line crosses the northern part of the County. Another extends from the Rapidan River at Route 522 northeast to the Rappahannock River south of the 29 Bypass. The third line branches south of Stevensburg and extends west crossing Routes 3 and 29, terminating in the Town of Culpeper.

NATURAL GAS

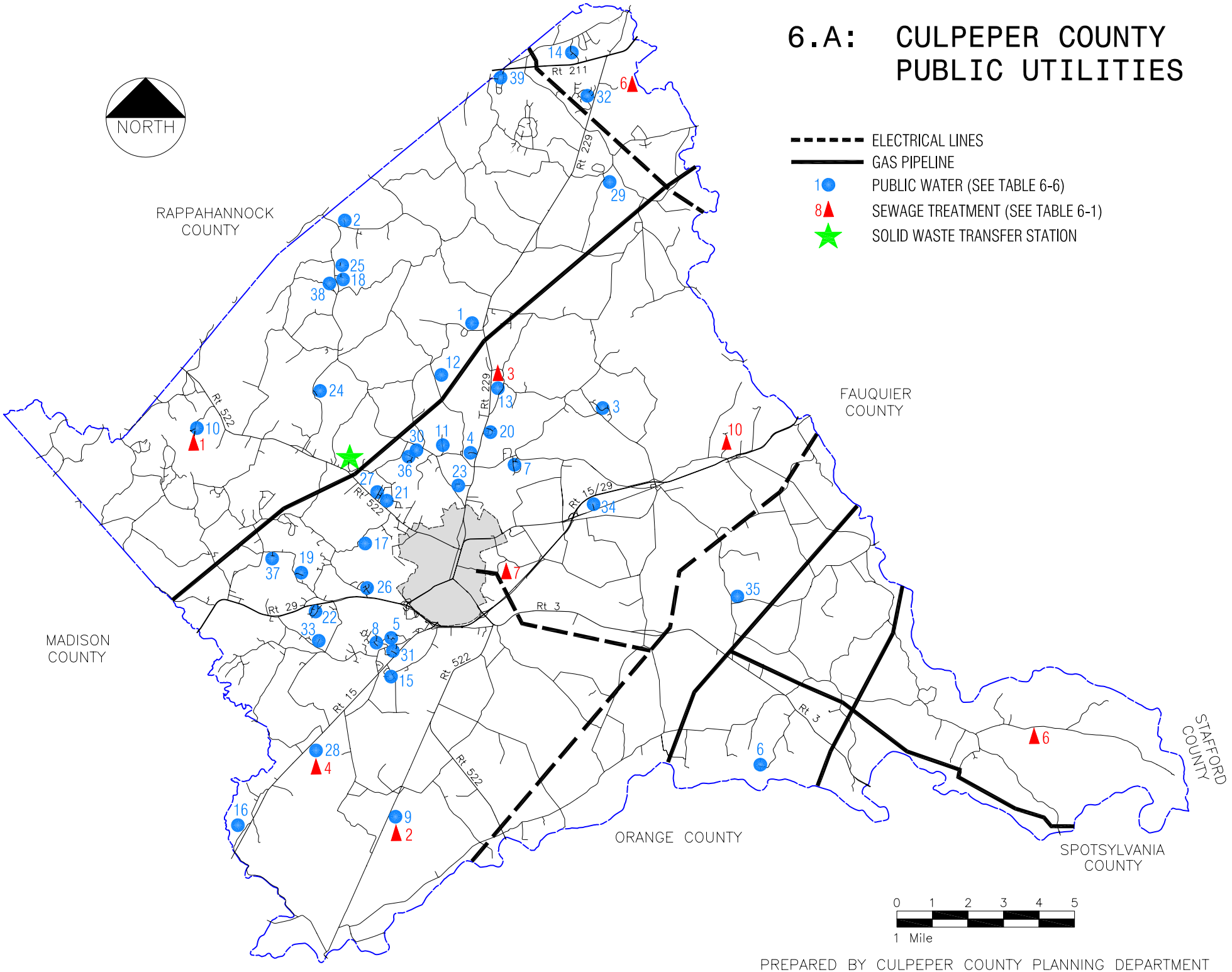
Natural gas is supplied by Amerigas and Columbia Gas. Amerigas has approximately 54 miles of pipelines and distribution lines within the Town and County. Columbia Gas has several miles of pipelines and distribution lines in the County. The pipelines are 20 inches in diameter with service lines generally between 1-2 inches in diameter.

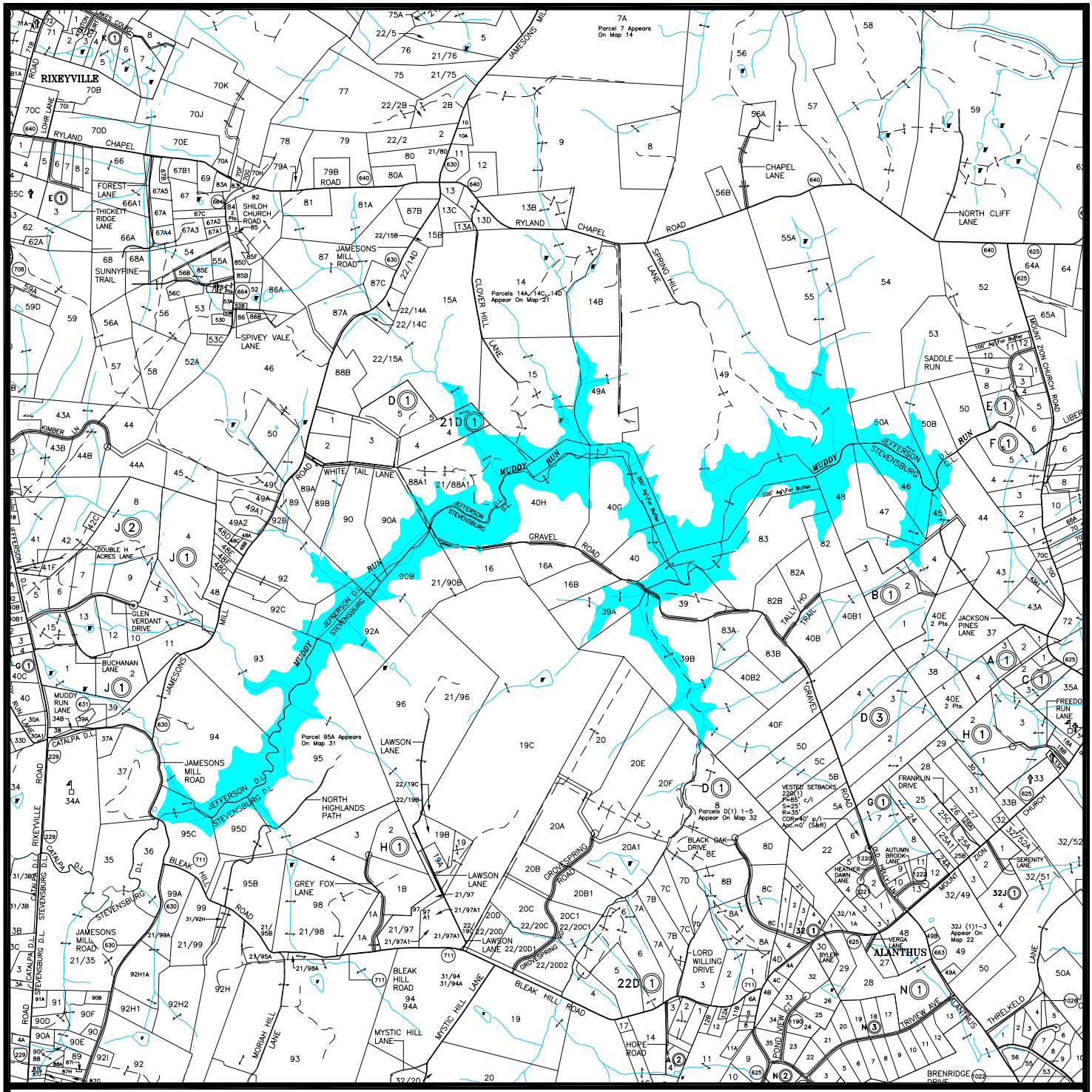
Approximately twenty miles of Amerigas transmission line extend from Crooked Run North of Route 29, northeast across Route 522 at the intersection of Route 638, to Route 229 south of Route 633, to the Rappahannock River, south of Route 802. A third pipeline extends from the Amerigas pipeline at the intersection of Routes3 and 699 and runs east along the north side of Route 3 and the Rapidan River down to Ely's Ford.

A third company, Transcontinental (Transco) Gas Corporation has approximately 9 miles of pipeline running through the County with no service available at this time. Located in the southeastern part of the County, the pipeline extends from the Rapidan River at Potato Run, northeast across Route 3, and the Rappahannock River north of Kelly's Ford. Three pipelines between 30-36 inches in diameter exist within a utility easement averaging 40 feet in width.

TELECOMMUNICATIONS

Cable television, with a 60+-channel service, is provided by Adelphia. Service areas extend throughout the County; however, service availability is severely limited in the rural areas of the County. The county is divided into six franchise areas (Map 6.C). Portions of all six areas have been provided with cable service. It is our desire to see cable service availability increase steadily until anyone desiring service can obtain it. The County is also supportive of efforts to make broadband communications available county-wide.


6.A: CULPEPER COUNTY
PUBLIC UTILITIES
NORTH
ELECTRICAL LINES
GAS PIPELINE
PUBLIC WATER (SEE TABLE 6-6)
SEWAGE TREATMENT (SEE TABLE 6-1)
SOLID WASTE TRANSFER STATION
RAPPAHANNOCK COUNTY
FAUQUIER COUNTY
MADISON COUNTY
ORANGE COUNTY
SPOTSYLVANIA COUNTY
STAFFORD COUNTY
Rt 211
Rt 229
Rt 522
Rt 15/29
Rt 29
Rt 3
Rt 15
0 1 2 3 4 5
1 Mile
PREPARED BY CULPEPER COUNTY PLANNING DEPARTMENT

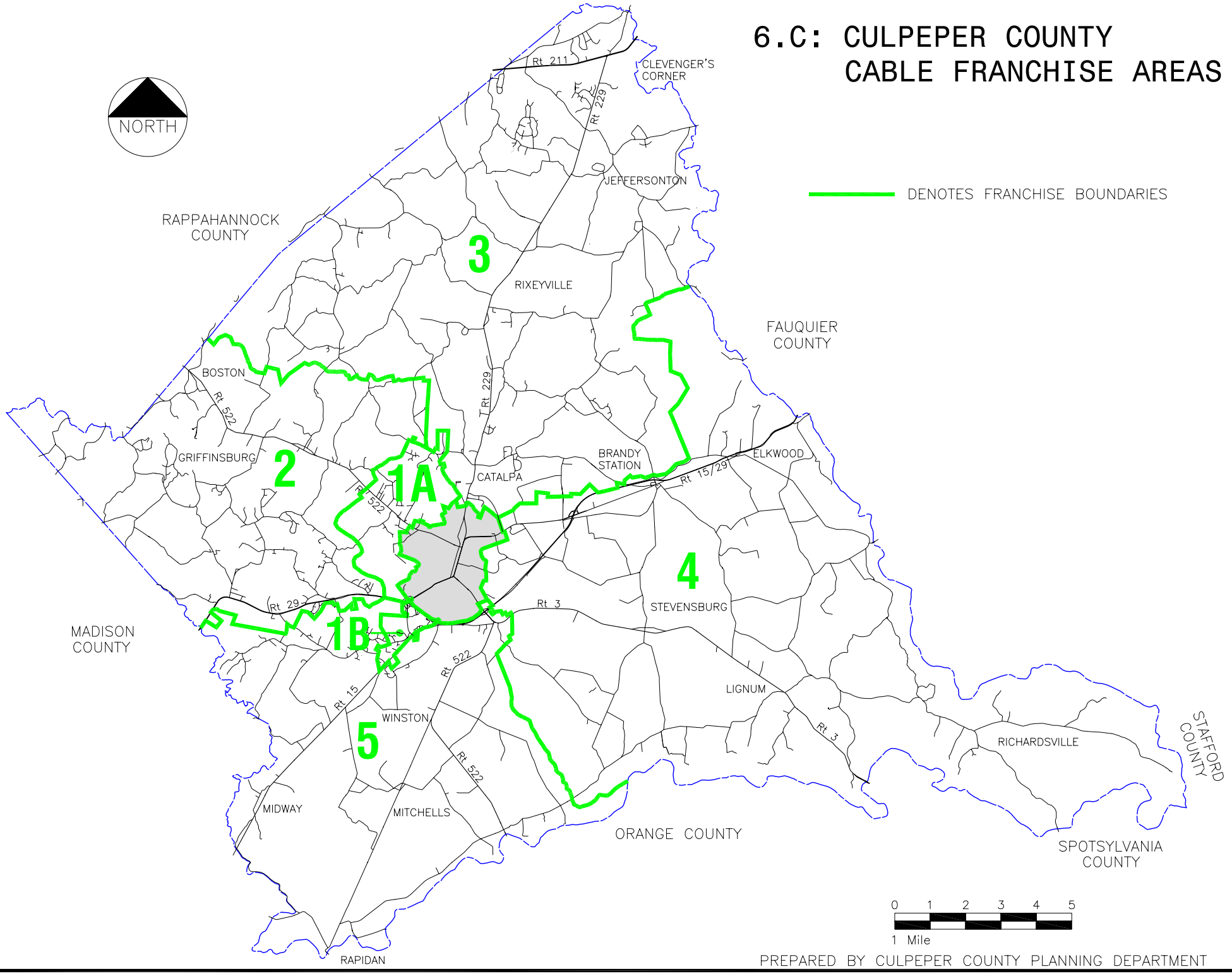


6.B - CULPEPER COUNTY
FUTURE SURFACE WATER IMPOUNDMENT

0 1/4 mile 1/2 mile 1 mile 1 1/2 miles

PREPARED BY CULPEPER COUNTY PLANNING DEPARTMENT

6.C: CULPEPER COUNTY CABLE FRANCHISE AREAS



PREPARED BY CULPEPER COUNTY PLANNING DEPARTMENT

Next - Chapter 6A
Table of Contents
Back - Chapter 5